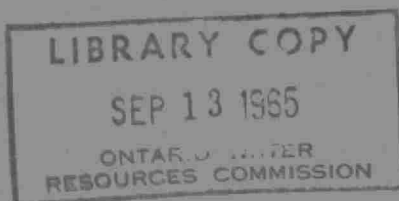


THE  
ONTARIO WATER RESOURCES  
COMMISSION  
WATER POLLUTION SURVEY  
of the  
VILLAGE OF HASTINGS  
in the  
COUNTY OF NORTHUMBERLAND



June, 1965

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THE  
ONTARIO WATER RESOURCES COMMISSION

Report on

A  
WATER POLLUTION SURVEY  
of the

VILLAGE OF HASTINGS

in the

COUNTY OF NORTHUMBERLAND

Division of Sanitary Engineering

June 1965

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REPORT ON  
WATER POLLUTION SURVEY  
OF THE  
VILLAGE OF HASTINGS

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Map of the Village of Hastings

## INTRODUCTION

A water pollution survey of the Village of Hastings was performed on March 24, 1965. Surveys of this type are made by the Ontario Water Resources Commission in order to locate potential and existing sources of surface water pollution. The control of surface water quality is a major responsibility of this Commission. Recommendations are made concerning the abatement of conditions which adversely affect water quality. Appended to this report is a map of Hastings showing the locations of sampling points.

## PREVIOUS SURVEYS BY OWRC STAFF

The initial water pollution survey of Hastings was performed by Commission staff during the period of February 28 to March 2, 1962. The pertinent survey reports included the following recommendations:

1. Until municipal sanitary sewers and sewage treatment works can be provided at Hastings, efforts should be made to exclude untreated or inadequately treated wastes from the Trent River and its tributaries within the municipality.
2. The Breithaupt Leather Company Limited should continue its planning to provide industrial waste treatment facilities which will be acceptable to this Commission.

### INTERVIEWS WITH OFFICIALS

Discussions were held with the following officials during this recent survey on March 24, 1965:

Mr. R. R. Burnham, Reeve;

Mr. J. Finlayson, Chief Public Health Inspector, Northumberland-Durham Health Unit.

An unsuccessful attempt was made to contact Mr. F. S. Crate, Clerk-Treasurer of the village. Excellent assistance was provided by Mr. E. A. Lanctot, Public Health Inspector, Northumberland-Durham Health Unit.

### VILLAGE OF HASTINGS

Hastings is located approximately 29 miles north-east of Cobourg and is served by Highway 45 which extends through the village. According to the 1965 Municipal Directory, the population of Hastings is approximately 850. The area of the municipality is approximately 616 acres.

The Trent River pursues a north-easterly course through the village.

### WATER USES

#### Municipal

The Trent River is the source of the municipal water supply at Hastings. The pumphouse is located on the north bank of the river in the upstream part of the village.

#### Industrial

The Breithaupt Leather Company Limited utilizes river water for industrial requirements.

### Recreational

Local bathing areas are located on both banks of the river upstream from the Highway 45 bridge.

### WATER SUPPLY

The construction of municipal water works at Hastings was undertaken as an OWRC project and was completed during 1962. The source of water supply is the Trent River, with the purification plant and intake works being located on the north bank of the watercourse in the upstream part of the village. The 12-inch diameter corrugated metal intake pipe extends outward for a distance of 150 feet into the river and terminates where the water depth averages 13 feet. Chlorination facilities are utilized. Water storage is provided by a steel standpipe which is located at a higher elevation in the village and has a capacity of 110,000 gallons.

### SURFACE WATER DRAINAGE

Due to the topography of the village, surface run-off flows drain to the Trent River.

Three small drainage courses or tributaries of the river are generally local in source and empty into the watercourse at the foot of New Street, on the south bank approximately 600 feet downstream from the Highway 45 bridge, and at the downstream end of the tail-race, respectively.

### SANITARY WASTE DISPOSAL

Attempts have been made in Hastings to provide sewage disposal facilities on individual premises. However, like many waterfront communities where municipal sanitary sewers



are not provided, it is almost inevitable that some waste flows will gain access to the river unless adequate planning and supervision are provided. Since its inception, the Northumberland-Durham Health Unit has provided control of the installation of new private sewage disposal facilities.

#### CONSIDERATION RE SEWAGE WORKS

Information received from the local municipal officials has indicated that the financial expenditure required for the installation of public sewage works at Hastings would cause grave concern at this time. However, if the present sewage disposal problems can be corrected on a private basis, the provision of municipal sewage works could be deferred until a more opportune time.

#### INDUSTRY

The principal industrial firm in Hastings is the Breithaupt Leather Company Limited. This tannery is located on the north bank of the Trent River downstream from the more developed part of the village.

The waste disposal procedures utilized at this plant have been investigated by members of the Industrial Wastes Branch of this Commission. A daily waste discharge to the river of approximately 113,000 gallons has been reported, containing BOD and suspended solids loadings of 1,700 pounds and 3,200 pounds, respectively. Although a stationary screening device has been installed to exclude coarse solids from the plant discharge, it was apparent on March 24, 1965, that this facility has a very limited degree of effectiveness.

Officials of the firm have discussed this waste disposal problem with Commission staff on March 25, 1965. The company officials have been requested to study waste treatment procedures which will be acceptable to this Commission.

#### PRIVATE OUTFALLS

Three instances were observed where sewage was discharging from private premises or outfalls to the river.

The Trentway Grill is located on the south side of Water Street in Hastings. The sewage flows reportedly are discharged from this eating establishment to a septic tank and thence to the river. This sewer was utilized also by the Royal Hotel until September, 1964, when a sub-surface sewage disposal system was installed on the hotel premises with the approval of the Medical Officer of Health. These conditions were investigated by members of the OWRC and Health Unit staffs on January 12, 1965. The pertinent inspection report recommended that the owner of the Trentway Grill should take action to exclude the sewage flows from the river.

A brief inspection was made at the premises which are located on the north bank of the head-race at the south-west corner of the intersection of Bridge Street and Front Street. This building is occupied by a restaurant, a barber shop, approximately five apartments, and two shops which were vacant at the time of this survey. The sewage

flows from this building are discharged to a septic tank and thence to the river. The outfall was not readily accessible for sampling during this survey. The Medical Officer of Health has requested that adequate sub-surface sewage disposal facilities should be installed to serve these premises.

Sewage flows resulting from the operation of Mr. L. J. Simpson's commercial automatic laundry on the south side of Front Street are discharged to primary treatment facilities and thence to a tile bed system. An inspection revealed on March 24, 1965, that waste was seeping from this tile bed to the river. Mr. Simpson reported that adequate remedial measures would be effected as soon as possible.

#### MUNICIPAL REFUSE DISPOSAL SITE

The site utilized by the village for refuse disposal is located south of the municipality in the Township of Percy. No problems have been reported concerning any effects which this operation might exert on water quality.

#### SAMPLING PROCEDURE

Although some snow cover remained on March 24, 1965, the atmospheric temperature increased sufficiently to produce appreciable surface run-off during the day.

Samples were collected from the Trent River and obvious outfalls discharging thereto in Hastings on March 24. An additional set of samples was collected on May 17, 1965, by Mr. E. A. Lanctot, Public Health Inspector, Northumberland-Durham Health Unit.

Appended to this report is a map of Hastings showing the locations of the sampling points. The pertinent laboratory results are appended to this report in Tables I and II.

#### INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

The analyses employed to determine the quality of samples are: biochemical oxygen demand (BOD), solids, tests for specific chemicals, tests for anionic detergents as ABS, and the enumeration of coliform organisms. All of the samples collected on March 24 were submitted to the OWRC laboratory in Toronto, as were the samples collected on May 17 for chemical analysis. The samples obtained on the latter date for bacteriological examination were submitted to the Peterborough Regional Laboratory of the Ontario Department of Health.

The BOD of sewage, industrial wastes, or polluted waters, is the oxygen required during stabilization of the decomposable organic or chemical material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. A high BOD is indicative of organic or chemical pollution. The BOD of a watercourse should not exceed four parts per million (ppm).

The analyses for solids include tests for total, suspended, and dissolved solids. The results are reported in parts per million. The first test measures both the solids in solution and in suspension. The suspended solids indicate the measure of undissolved solids of organic

or inorganic nature in suspension. Land erosion, sewage, and industrial wastes, are significant sources of suspended solids. Suspended solids in water can present difficulties associated with water purification, and might result in depositions in streams which can interfere with the habitat of aquatic life. The dissolved solids are a measure of those solids in solution.

The presence of anionic detergents as ABS usually is an indication that domestic waste is contained in the sample.

The coliform count is employed to obtain an enumeration of coliform organisms. The presence of coliforms indicates pollution by human or animal excrement, or by some non-faecal forms. It is the opinion of the OWRC that the presence of coliforms in a watercourse should not exceed 2,400 organisms per 100 millilitres (ml) of water. The membrane filter technique was used in the bacteriological examination of water samples submitted to the OWRC laboratory, and the number of coliforms is reported per 100 ml of the sample. The Peterborough Regional Health Laboratory utilized the Most Probable Number (MPN) method to provide an index of the number of coliform organisms per 100 cubic centimeters of the water sample. The Multiple Tube Fermentation technique was employed by that laboratory in performing the examinations.

E.coli organisms are members of the coliform group but definitely originate in the intestinal tract of humans or animals.

#### SAMPLE RESULTS

The laboratory results are shown in appendices to this report as follows:

Table I - Trent River at Hastings

Table II - Outfalls to Trent River  
at Hastings

#### Trent River at Hastings

Although the quality of the Trent River water was satisfactory at the CNR bridge upstream from Hastings, excessive coliform counts were revealed in the river water at the tail-race and near the north bank downstream from the tannery sewer outfall.

#### Outfalls to Trent River at Hastings

The high coliform counts and the presence of ABS indicate the presence of sewage in all of the outfalls to the river except the drainage course (Sampling Point No.T. 51.79D) which discharges on the south bank of the river east of the Highway 45 bridge (Bridge Street). A high BOD was revealed in the municipal sewer outfalls which are located east of the Canadian Legion Hall and near the Hastings Hydro-Electric Commission office, respectively. The presence of sewage in these outfalls was visually evident during the collecting of samples.

The quality of the waste discharging from the Breithaupt Leather Company Limited plant to the river was objectionable. The need for adequate treatment of this waste is immediately obvious.

#### SUMMARY

A water pollution survey of the Village of Hastings was performed by Commission staff on March 24, 1965. Sampling of the Trent River and outfalls discharging thereto within the municipality was undertaken. An additional set of samples was collected subsequently on May 17, 1965, by a member of the Northumberland-Durham Health Unit staff.

Although Hastings has acquired a municipal water works system, municipal sewage works have not been provided. Consequently, sewage flows generally are discharged to private disposal systems. Investigations have revealed that some sewage flows gain access to the Trent River either directly or via municipal sewers and drainage courses.

Previous water pollution surveys were performed at Hastings on two occasions in 1962. The pertinent survey reports recommended that untreated or inadequately treated sewage flows should be excluded from the river. Compliance with these recommendations has not been entirely successful, as is substantiated by the appended sample results. It is gratifying to report that the Northumberland-Durham Health Unit staff is actively pursuing private sewage disposal problems, and that officials of the Breithaupt Leather Company are attempting to devise waste treatment procedures for

the local plant which will be acceptable to the OWRC.

RECOMMENDATIONS

If the provision of municipal sewage works at Hastings is not economically feasible at this time, effective action should be taken to protect the quality of the Trent River water by excluding untreated or inadequately treated waste therefrom.

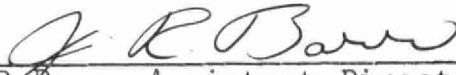
The Breithaupt Leather Company Limited is urged to adopt methods of waste treatment which will be acceptable to this Commission.

All of which is respectfully submitted,

District Engineer:

  
J.K. Theil

Approved by:

  
J.R. Barr, Assistant Director,  
Division of Sanitary Engineering.

ds



TABLE I

TRENT RIVER AT HASTINGSBACTERIOLOGICAL EXAMINATION

SAMPLE POINT No.	DATE OF SAMPLE	5-DAY BOD	TOTAL	SOLIDS		PH AT LAB.	ALKAL- INITY AS CaCO <sub>3</sub>	CHROME AS CR	ANIONIC DETERGENTS AS ABS	COLIFORMS PER 100 ML (M.F.)	TOTAL COLI- FORMS (MPN)	E. COLI
				SUSP.	DISS.							
1965												
T.52.7	MAR.24	1.7	148	4	144	--	--	--	--	14	--	--
	MAY 17	1.9	160	7	153	--	--	--	--	--	93	93
T.51.70	MAR.24	2.5	118	3	115	7.8	98	0.0	--	2,100	--	--
	MAY 17	1.1	164	5	159						240,000+	240,000+
T.51.49	MAR.24	2.7	163	3	160	7.7	99	0.0	--	800	--	--
	MAY 17	2.5	156	5	151	--	--	--	--	--	110,000	110,000
T.51.23	MAR.24	2.2	142	2	140	7.8	91	0.0	--	24	--	--
	MAY 17	1.6	148	5	143						23	23

T.52.7      TRENT RIVER AT CNR BRIDGE UPSTREAM FROM HASTINGS

T.51.70      TAIL-RACE UPSTREAM FROM MOUTH OF DRAINAGE COURSE AT WELLINGTON ST.

T.51.49      TRENT RIVER NEAR NORTH BANK - APPROX. 200 FT. DOWNSTREAM FROM TANNERY OUTFALL

T.51.23      TRENT RIVER NEAR SOUTH BANK AT EAST LIMIT OF VILLAGE

NOTE: ALL RESULTS EXCEPT PH REPORTED IN PARTS PER MILLION UNLESS OTHERWISE INDICATED.

TABLE II

SAMPLE POINT No.	DATE OF SAMPLE	OUTFALLS TO TRENT RIVER AT HASTINGS					BACTERIOLOGICAL EXAMINATION		
		5-DAY BOD	TOTAL	SOLIDS		ANIONIC DETERGENTS AS ABS	COLIFORMS PER 100 ML (M.F.)	M.P.N. PER 100 CC.	
				SUSP.	DISS.			TOTAL COLIFORMS	E. COLI
	1965								
T.52.13D	MAR.24	1.9	292	5	287	0.1	3,700	--	--
	MAY 17	0.7	326	2	324			930	930
T.51.94W	MAR.24	2.8	1536	80	1456	0.2	83,000	--	--
	MAY 17	2.2	950	262	688	--	--	4,300	2,300
T.51.89P	MAR.24	3.6	566	7	559	0.3	3,100	--	--
	MAY 17	5.7	592	48	554	--	--	110,000	110,000
T.51.87W	MAR.24	18.0	1894	400	1494	0.3	3,000	--	--

---

T.52.13D      MOUTH OF DRAINAGE COURSE DISCHARGING TO RIVER AT FOOT OF NEW STREET

T.51.94W      STORM SEWER OUTFALL ON SOUTH BANK OF RIVER AT WEST SIDE OF HWY.45 BRIDGE

T.51.89P      PRIVATE SEWER OUTFALL FROM TRENTWAY GRILL ON SOUTH BANK OF RIVER

T.51.87W      STORM SEWER OUTFALL ON NORTH BANK OF RIVER - EAST OF CANADIAN LEGION HALL

NOTE: ALL RESULTS EXCEPT PH REPORTED IN PARTS PER MILLION UNLESS OTHERWISE INDICATED.

TABLE 11 (CON'T)

## OUTFALLS TO TRENT RIVER AT HASTINGS

SAMPLE POINT No.	DATE OF SAMPLE 1965	5-DAY BOD	TOTAL	SOLIDS		PH LAB.	ALKALIN- ITY AS CaCO <sub>3</sub>	ANIONIC DETERGENTS AS ABS	BACTERIOLOGICAL EXAMINATION		
				SUSP.	DISS.				COLIFORMS PER 100ML (M.F.)	M.P.N. PER 100 CC. TOTAL COLIFORMS	E. COLI
T <sub>51</sub> .80W	MAR.24	21.0	1016	222	794			0.4	4,900,000	--	--
	MAY 17	2.0	646	4	642			--	--	4,300	4,300
T <sub>51</sub> .79D	MAR.24	1.8	286	7	279			0.0	194	--	--
	MAY 17	0.6	294	3	291			--	--	930	230
T <sub>51</sub> .70D	MAR.24	3.6	456	98	358			0.1	13,600	--	--
	MAY 17	1.0	366	3	363			--	--	46,000	46,000
T <sub>51</sub> .531	MAR.24	840.0	5598	1152	4446	5.9	128		70,000	--	--
	MAY 17	620.0	3004	1380	1624				--	--	--

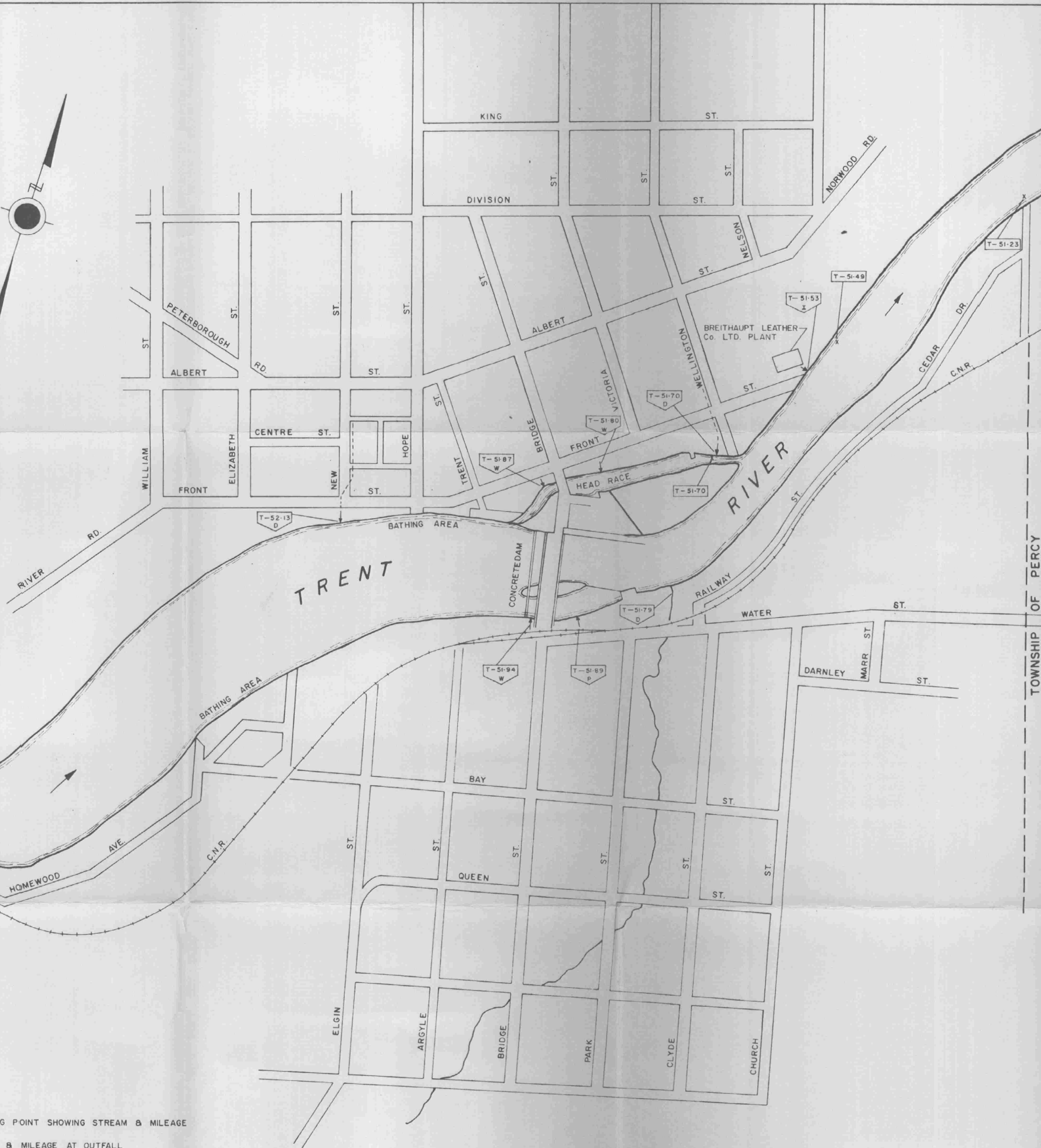
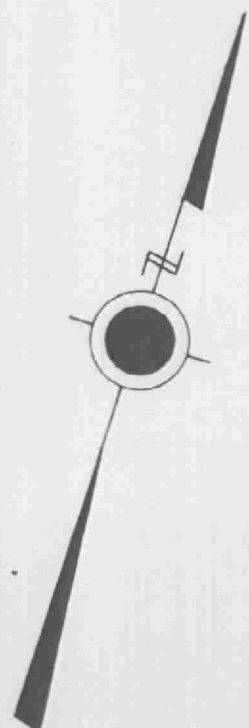
T<sub>51</sub>.80W STORM SEWER OUTFALL ON NORTH BANK OF RIVER - EAST OF HYDRO OFFICE

T<sub>51</sub>.79D MOUTH OF DRAINAGE COURSE ON SOUTH BANK EAST OF HWY.45 BRIDGE

T<sub>51</sub>.70D MOUTH OF DRAINAGE COURSE EMPTYING INTO TAIL-RACE

T<sub>51</sub>.531 OUTFALL FROM BREITHAUP LEATHER COMPANY LIMITED PLANT TO RIVER

NOTE: ALL RESULTS EXCEPT PH REPORTED IN PARTS PER MILLION UNLESS OTHERWISE INDICATED.



#### LEGEND

T-51-23 - SAMPLING POINT SHOWING STREAM & MILEAGE

T-51-70  
D - STREAM & MILEAGE AT OUTFALL  
- TYPE OF OUTFALL

D - DITCH OR DRAINAGE COURSE

W - STORM SEWER

P - PRIVATE SEWER

I - INDUSTRIAL WASTE SEWER

ONTARIO WATER RESOURCES COMMISSION

VILLAGE OF HASTINGS

WATER POLLUTION SURVEY 1965

SCALE: 1" = 400'

DRAWN BY: J.R.

DATE: MARCH, 1961

CHECKED BY:

DRAWING NO. 61-16

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MOE/HAS/WAT/ATAZ + map  
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